

3D-FPA Hybridization Improvements, Phase I

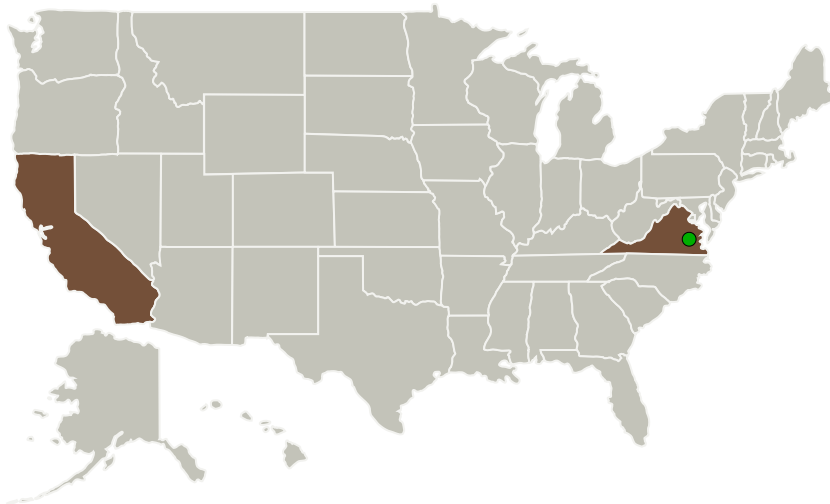
Completed Technology Project (2011 - 2011)



Project Introduction

Advanced Scientific Concepts, Inc. (ASC) is a small business, which has developed a compact, eye-safe 3D Flash LIDAR™ Camera (FLC) well suited for real-time spacecraft trajectory, speed, orientation measurements relative to the planet's surfaces and evaluating potential hazards during the critical landing sequence. Data collected using ASC's FLC at JPL's Mars Yard and in NASA ALHAT flight tests demonstrated that ASC Flash LIDAR system can meet the requirements for Entry Descent and Landing (EDL). Aboard the Space Shuttle Endeavour (STS-127), SpaceX and ASC demonstrated the DragonEye Autonomous Rendezvous and Docking (AR&D) Flash LIDAR solution in low earth orbit, the first Flash LIDAR in space. ASC is developing a camera for iRobot Corporation for use in autonomous robotic navigation which is directly applicable to EDL mission requirements. ASC will develop hybridization process improvements and process controls to increase the lifetime and pixel operability of the 3D-FPA. Current 3D-FPA hybrids see degradation in harsh environments. Shock, vibration, humidity and temperature cycles are all of concern. Improved assembly processes for the hybrid in the hermetic package will allow for improved operability, yield and lifetime. ASC's 128x128 3D array FLC has the equivalent of 16,000 range finders on a single FPA which allows the sensor to act as a 3D video camera with enhanced functionality and value add well beyond range finding.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Advanced Scientific Concepts, Inc.	Lead Organization	Industry	Goleta, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

 **February 2011:** Project Start

 **September 2011:** Closed out

Closeout Summary: 3D-FPA Hybridization Improvements, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137801>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Scientific Concepts, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

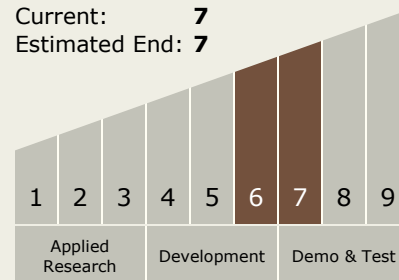
Carlos Torrez

Principal Investigator:

Brad Short

Technology Maturity (TRL)

Start: 6
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.4 Vehicle Systems
 - └ TX09.4.7 Guidance, Navigation and Control (GN&C) for EDL

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System